VIA EXPRESS MAIL. #EL921977343US
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Hiroshi Akimoto and Okeksandr v. Monasyrskyi	Filing Date:	7/15/03
Title:	MOTION COMPENSATION METHOD FOR VIDEO SEQUENCE ENCODING IN LOW BIT RATE SYSTEMS	Group Art:	Unknown
		Examiner:	Unknown

Serial No.: 10/620,879

Docket No.: SCT105U

Office of Petitions
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF WILLIAM L. HAYNES

I, William L. Haynes, am competent to make the following declaration and state as follows:

1. I presently reside in the Boston, Massachusetts area. I was an associate attorney, employed at Garrison & Associates PS, located at 2001 Sixth Avenue, Suite 3300, Seattle, WA 98121-2522 at the time the above-identified patent application was filed, which was July 15, 2003. I am one of the attorneys of record.

2. I am a member of the Bar of the State of Washington.

1

3.   I prepared the above-identified patent application for filing in the United States Patent and Trademark Office. On July 15, 2003, I reviewed all the documents listed on our document inventory, a copy of which is attached as Exhibit 1, to this declaration.

4.   Ten (10) sheets of drawings, copies of which are attached to this declaration as Exhibit 2, were a part of the patent application documents I reviewed. I executed the Transmittal of New Patent Application for filing in the United States Patent and Trademark Office, which was prepared by my legal assistant, Jolene McCracken, a copy of which is attached to this declaration as Exhibit 3. On July 15, 2003, I instructed Ms. McCracken to make copies of the application documents for our file and mail the above-identified patent application, including the required drawings, filing papers and fees, by Express Mail No. EL529896256US on July 15, 2003 to the United States Patent and Trademark Office.

I declare, under penalty of perjury, that the foregoing is true and correct, and all statements made of my own knowledge are true and all statements made on information and belief are believed to be true.

June 8, 2005
Date

William L. Haynes

The U.S. Patent and Trademark Office Date Stamp Affixed Heron Will Acknowledge Receipt of the Following:

1.) Transmittal of New Patent Application (5 pages);
2.) Combined Declaration and Power of Attorney (2 pages);
3.) Credit Card Authorization Form in the amount of $375 (1 page);
4.) Utility Patent Application (22 pages);
5.) Figures (10 sheets); and
6.) Notice of Recordation (1 page);
7.) Assignment (2 pages);
8.) Credit Card Authorization Form in the amount of $40 (1 page); and
9.) Return Receipt Postcard

Mailed July 15, 2003 via Express Mail No. EL529896256US
wlh/jm

EXHIBIT 1

FIG.1

INPUT AND OUTPUT STREAMS OF FRAME.
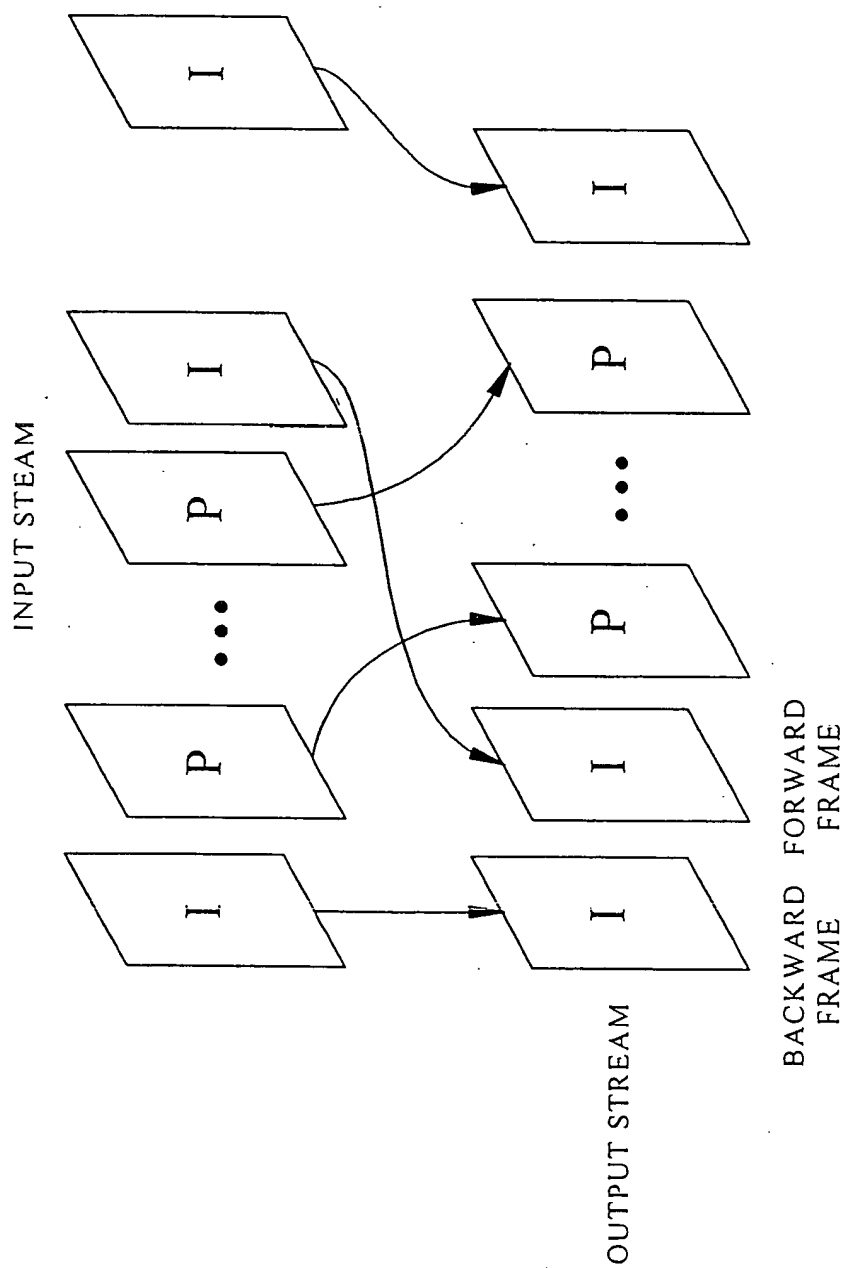
INPUT STEAM

OUTPUT STREAM

BACKWARD   FORWARD
FRAME   FRAME

FIG.2

PREDITION ERROR COMPUTING
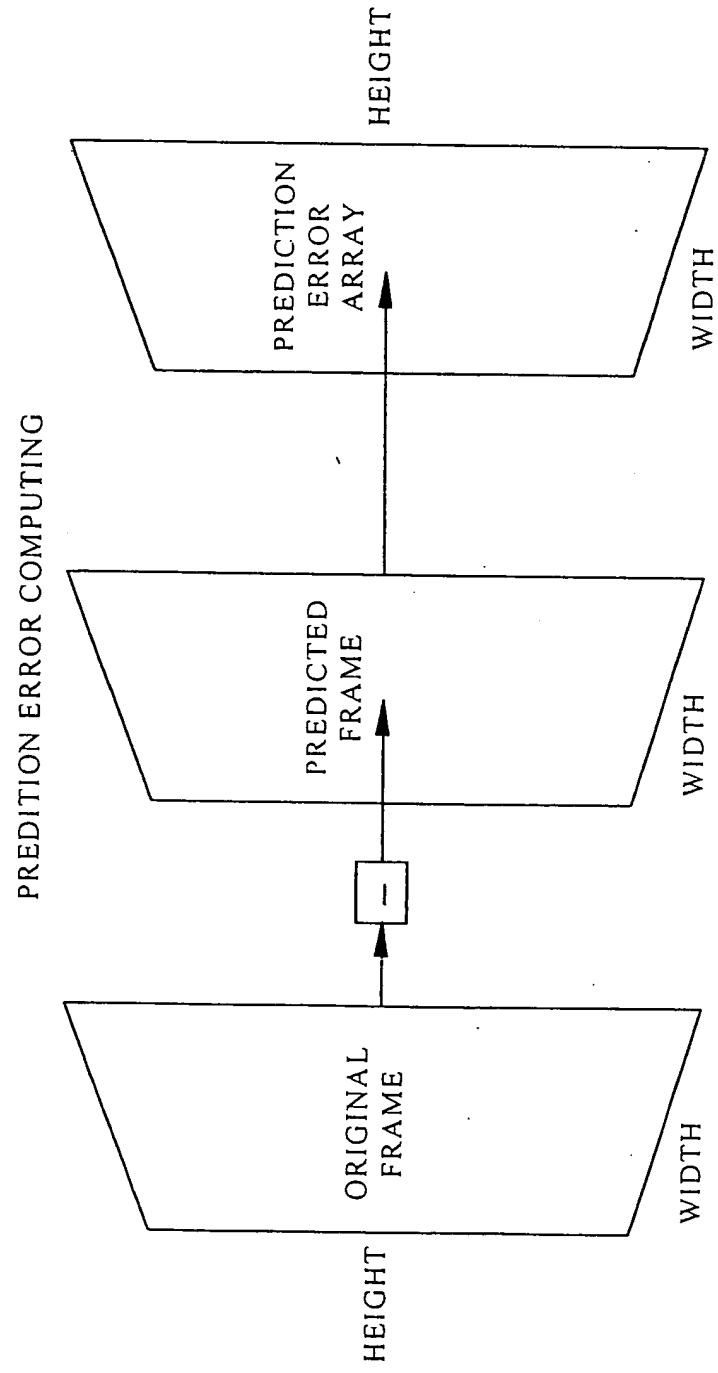
MOTION COMPENSATION SCHEME

PREDICTION
ERROR
COMPUTING

ERROR ARRAY
COMPRESSING

PREDICTION
ERROE
COMPENSATING

PREDICTION
ERROR
QUANTIZING

MERGE_COMPACT

NEW_MERGE_COMPACT

FIG.3

SIGNIFICANT
AREA
ISOLATING

FIGURE_COVERING

TOPOLOGY
MASK
CONSTRUCTING

COMPRESSING

FIG.4

MERGE COMPACT METHOD

ERROR ARRAY

G

g_0	g_1
g_2	g_3

WIDTH

HEIGHT

ARRAY AFTER MERGE_COMPACT METHOD

$E_{COMPACT}$

HEIGHT / 2

WIDTH / 2

G

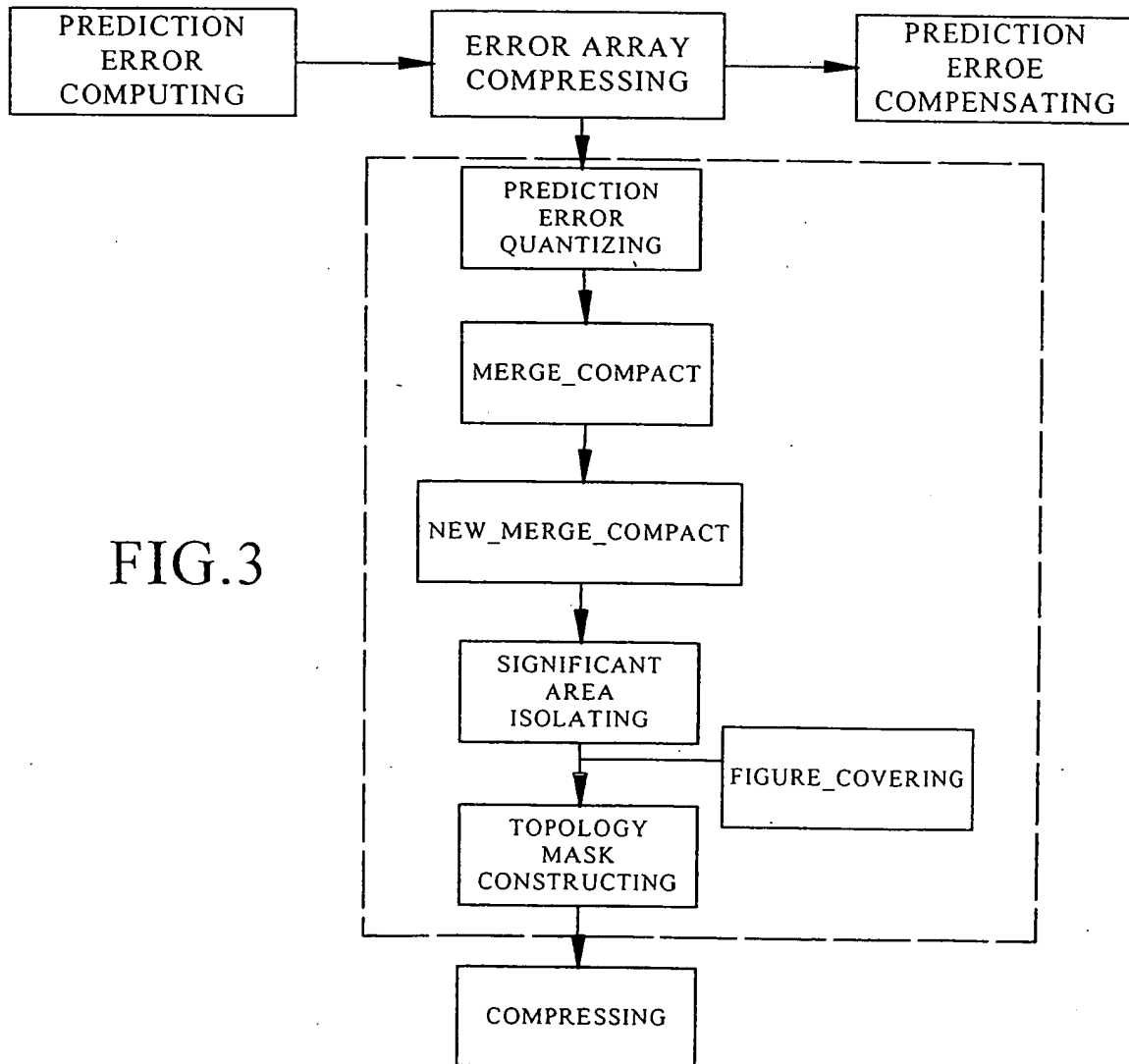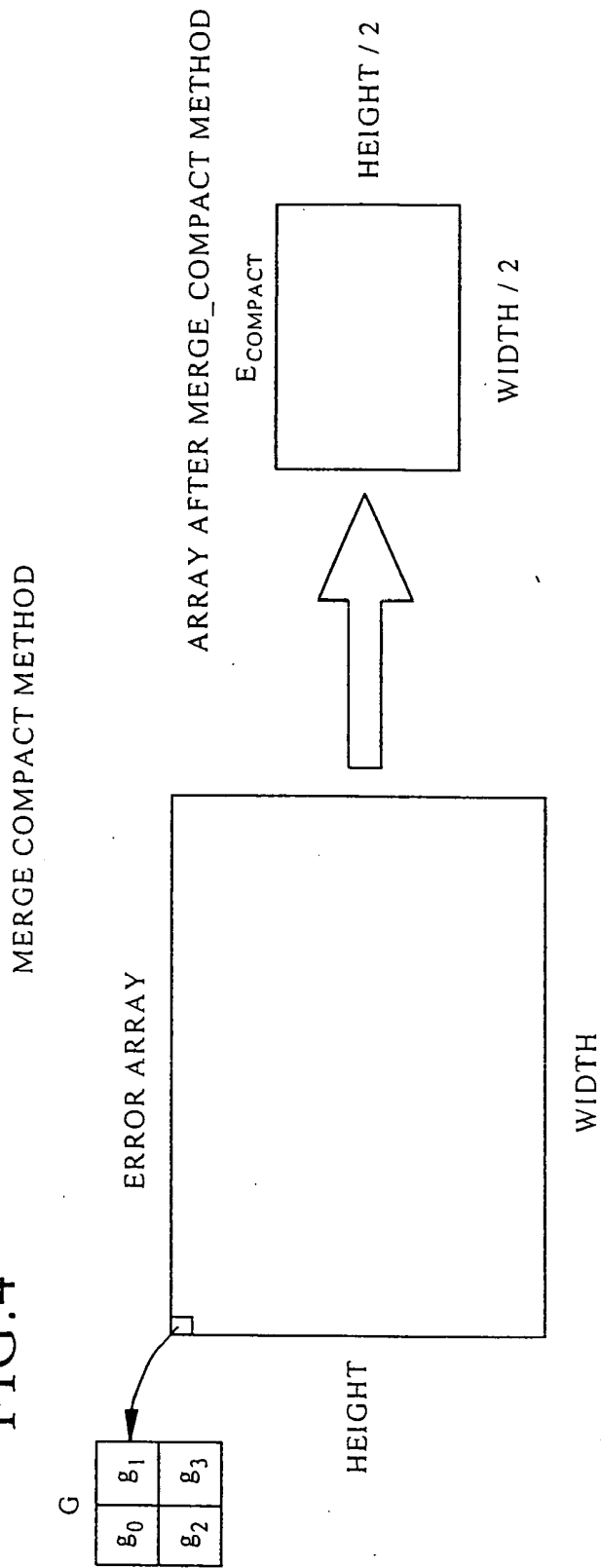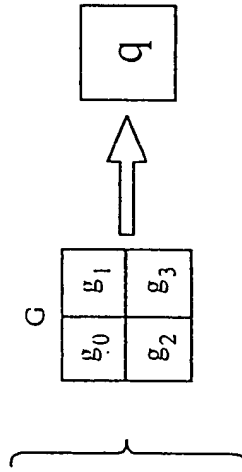| g_0	g_1
g_2	g_3

⟹ q

$E_{COMPACT}$ FORMING CONDITIONS:

1. $g_0 = g_1 = g_2 = g_3 = x \Rightarrow q = x$.
2. $g_i > 0, i = \overline{0,3} \Rightarrow q = g_{min}$.
3. $g_i < 0, i = \overline{0,3} \Rightarrow q = g_{min}$.
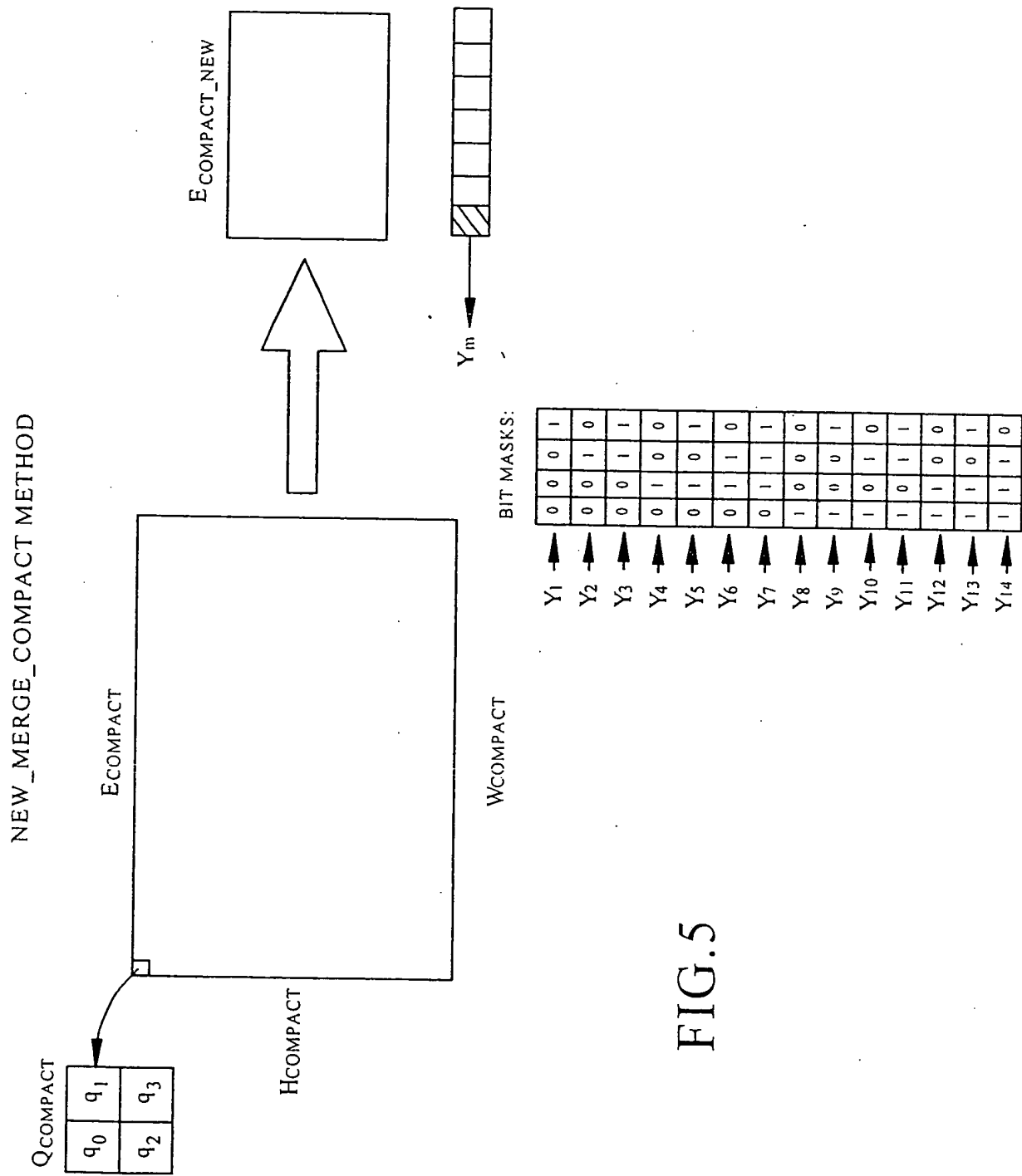4. $g_i < 0 \& g_i > 0 \,||\, g_i = 0, i = \overline{0,3} \Rightarrow q = 0$.

NEW_MERGE_COMPACT METHOD

$Q_{COMPACT}$

q_0	q_1
q_2	q_3

$E_{COMPACT}$

$H_{COMPACT}$

$W_{COMPACT}$

$E_{COMPACT\_NEW}$

Y_m

BIT MASKS:

0	0	0	1
0	0	1	0
0	0	1	1
0	1	0	0
0	1	0	1
0	1	1	0
0	1	1	1
1	0	0	0
1	0	0	1
1	0	1	0
1	0	1	1
1	1	0	0
1	1	1	1
1	1	1	0

Y_1
Y_2
Y_3
Y_4
Y_5
Y_6
Y_7
Y_8
Y_9
Y_{10}
Y_{11}
Y_{12}
Y_{13}
Y_{14}

FIG.5

FIG.6

NEW_MERGE_COMPACT METHOD EXAMPLE

1. $Q_{COMPACT}$

-5	-3
8	3

$S_+ = 11, \quad S_+ > S_-.$
$S_- = 8.$

2.

0	0
8	3

$\implies$ BIT MASK $\implies$

0	0	1	1

Y_3

$\Uparrow$ Y_3

TO M ARRAY

$\implies Y_3$

3.

0	0
8	3

$3 < 8$ $\implies$ $q_{NEW} = 3 + k$

FIG.7

SIGNIFICANT AREA ISOLATING

ISOLATED AREA

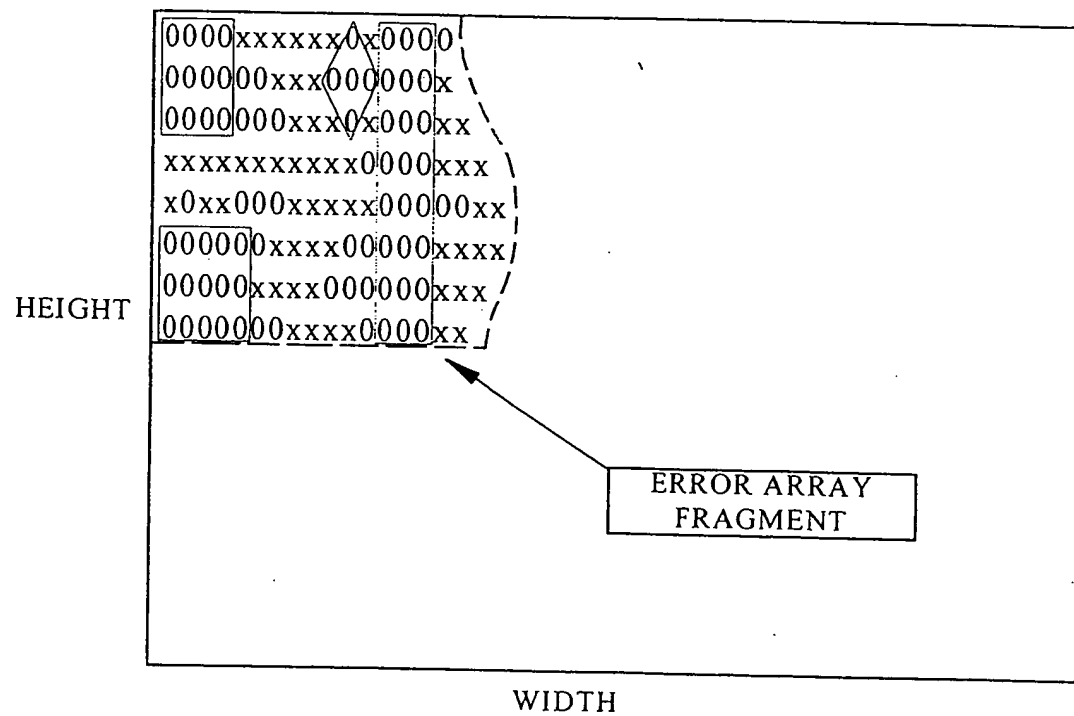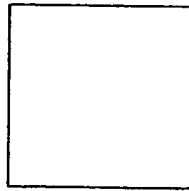| T | B | L | R |

2 BYTES
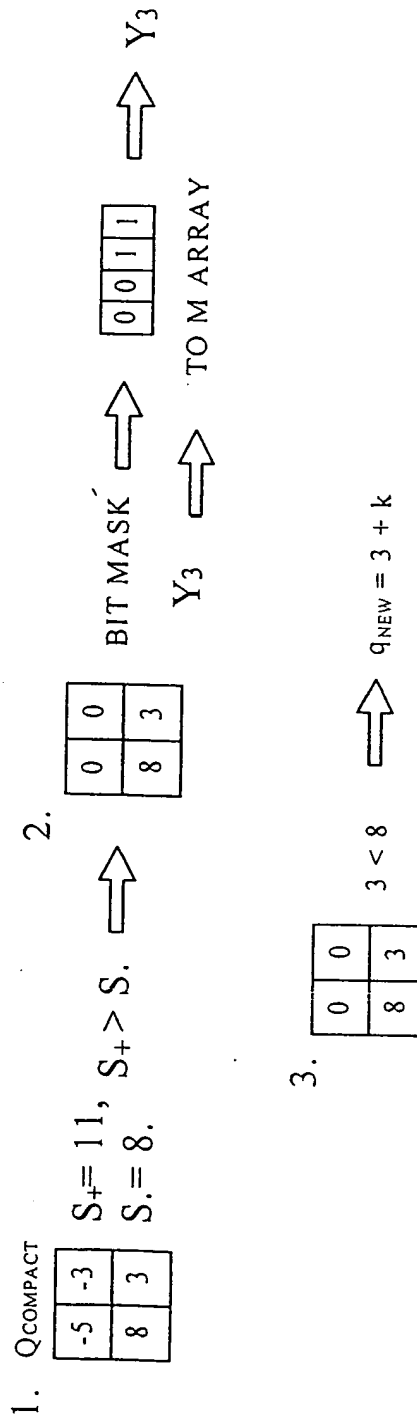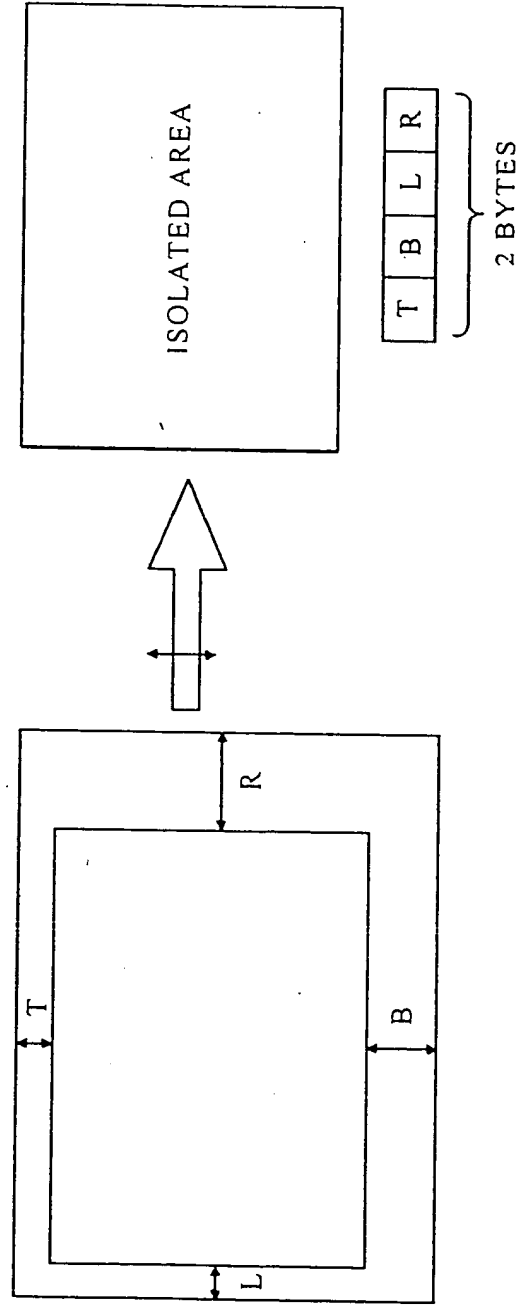
FIG.8

FIGURE COVERING METHOD

FIG.9

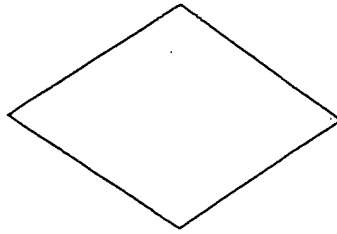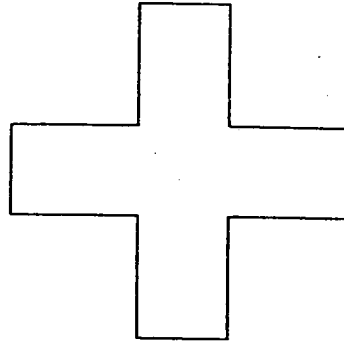GEOMETRIC FIGURE TYPES USED FOR FIGURE COVERING
METHOD AND DATA WRITING ORDER

FIGURE TYPES:
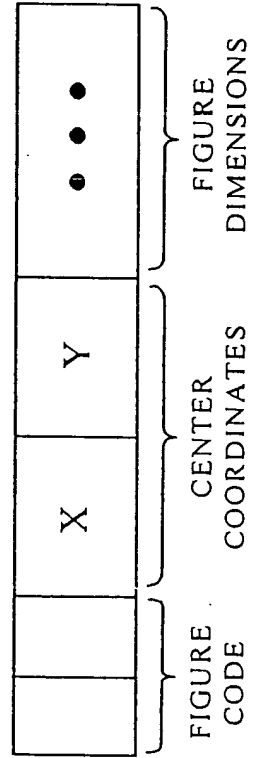

RECTANGLE SQUARE RHOMBUS CROSS

DATA WRITING ORDER:

FIGURE CODE CENTER COORDINATES FIGURE DIMENSIONS

FIG.10

TOPOLOGY MASK CONSTRUCTING

a

ARRAY OF NONZERO ELEMENTS El   ARRAY OF SIGN S

Ac

BIT MASK ARRAY B

ARRAY OF ABSOLUTE VALUES Abs

$e > 0, s = 0;$
$e < 0, s = 1.$

b   Ac FRAGMENT:

$$\begin{array}{rrr} 3 & 0 & 4 \\ 0 & 0 & 1 \\ 2 & 0 & -1 \end{array} \rightarrow \begin{array}{rrr} 1 & 0 & 1 \\ 0 & 0 & 1 \\ 1 & 0 & 1 \end{array}$$

El

| 3 | 4 | 1 | 2 | -1 |

S

| 0 | 0 | 0 | 0 | 1 |

Abs

| 3 | 4 | 1 | 2 | 1 |